CAL LAB C0119

Advance

LOW FREQUENCY SIGNAL GENERATOR

TYPE J

Including J1, J2, J1/NA, J2/NA, J1/E, J2/E,

DEPT. 105

INSTRUCTION MANUAL

ADVANCE COMPONENTS LIMITED
ROEBUCK ROAD, HAINAULT, ILFORD, ESSEX
Telephone: HAINAULT 4444/5/6/7 Telegrams: ATTENUATE ILFORD

SPECIFICATION

DISTORTION

Total harmonic and hum content as compared with fundamental, above 100 c/s:

better than 34 dB down (2%) at full output

better than 40 dB down (1%) at 0.1 watt.

There is a slight increase in distortion below 100 c/s but it is still low down to 15 c/s.

POWER SUPPLIES

J1, J2:

105 to 125 volts, 210 to 250 volts, a.c. only, 40 to 100 c/s.

J1/NA, J2/NA:

117 volts, a.c. only, 25 to 60 c/s.

J1/E, J2/E:

110 to 125 volts, 140 to 160 volts, and 220 volts, a.c. only, 40 to 100 c/s.

CONSUMPTION

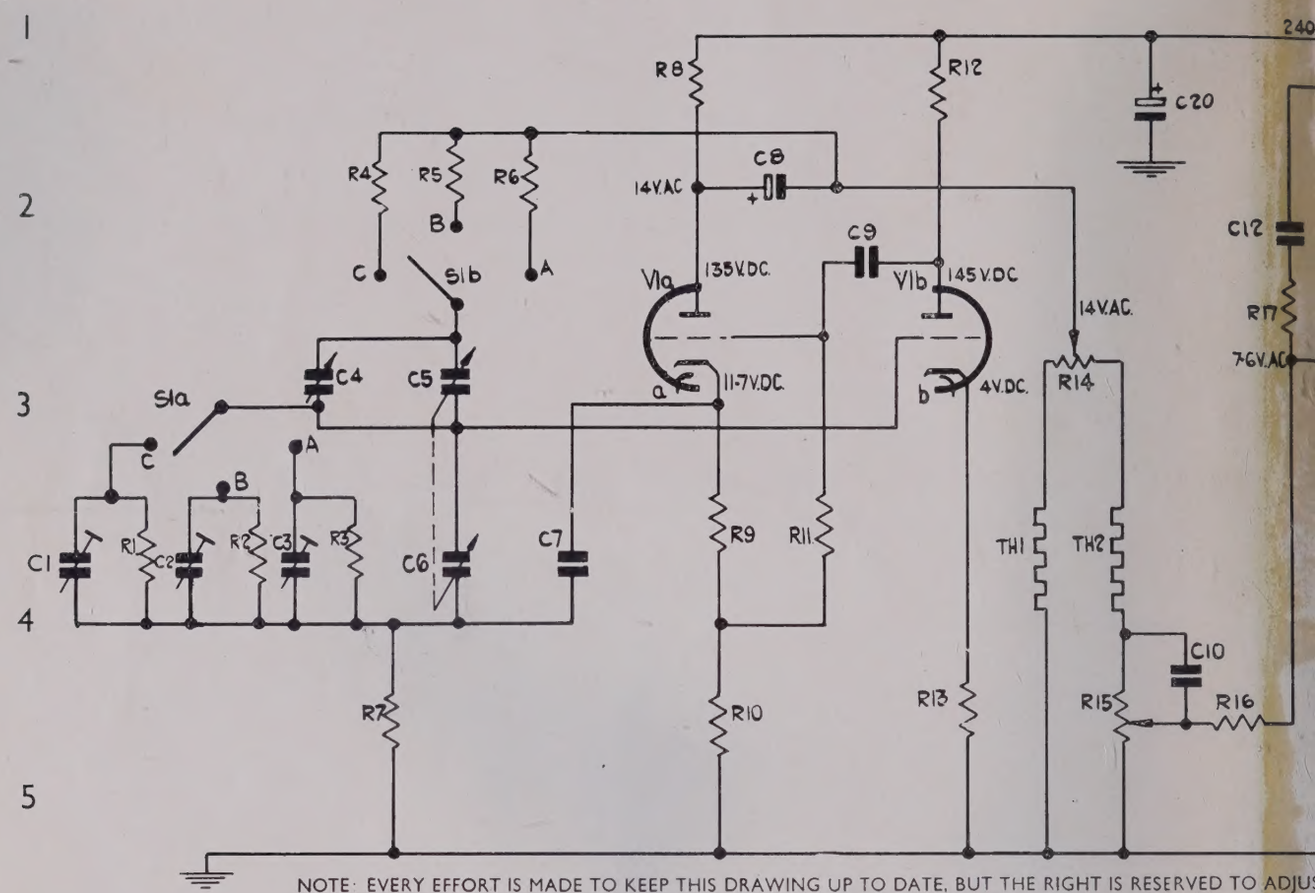
Approximately 40 watts

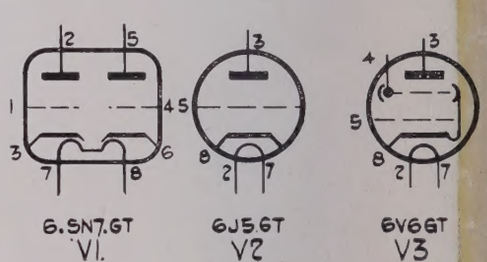
WEIGHT

20 lb.

OVERALL DIMENSIONS

$13\frac{1}{2}$in. x $10\frac{1}{4}$in. x $8\frac{1}{4}$in.





RESISTORS

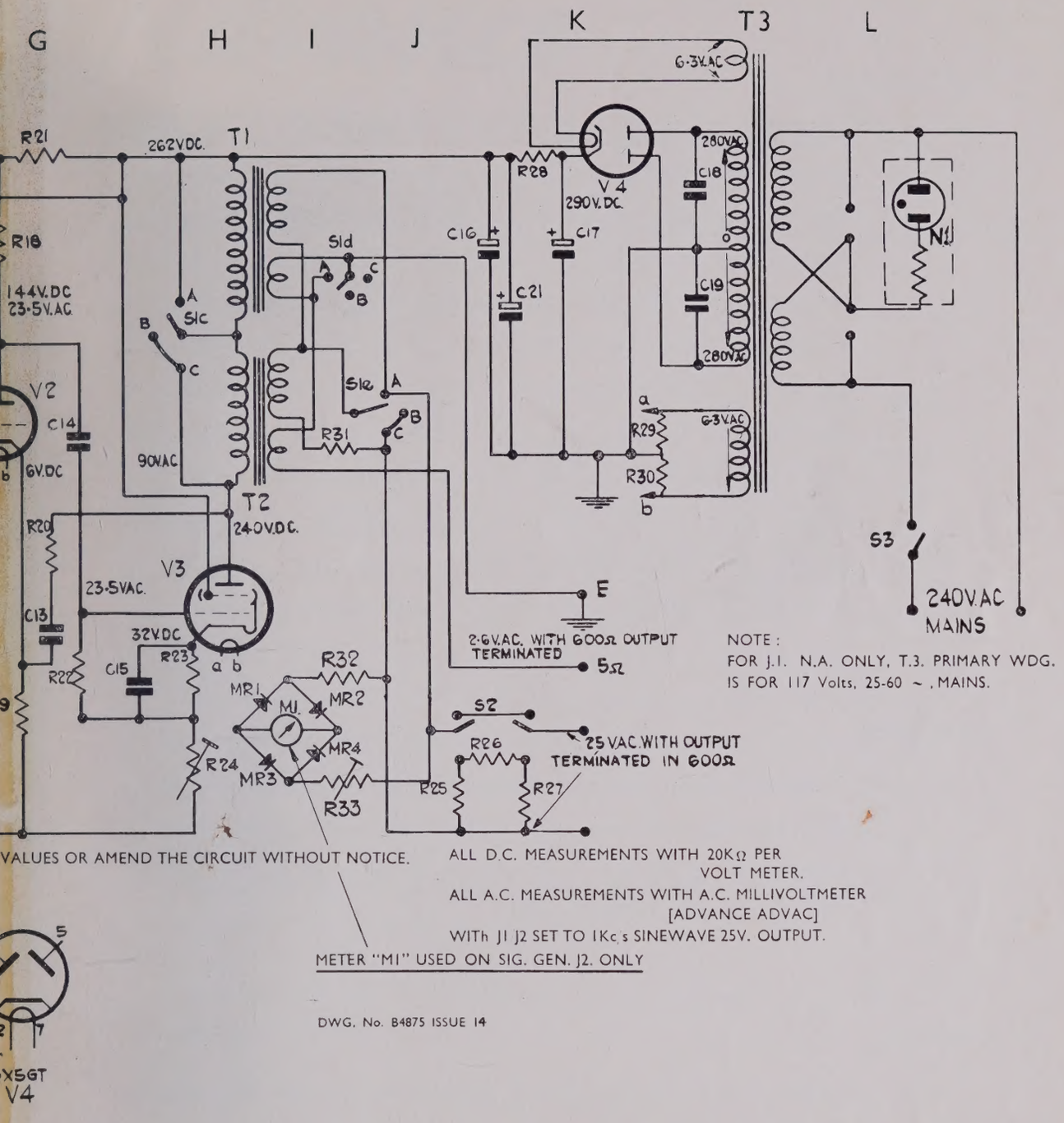
Ref.	Description	Pt. No.	Cir. Ref.
R 1	13M ± 1% 2W High stability	6700	A4
R 2	1M ± 1% ½W High stability	6701	A4
R 3	70K ± 1% ½W High stability	6702	B4
R 4	13M ± 1% 2W High stability	6700	B2
R 5	1M ± 1% ½W High stability	6701	B2
R 6	70K ± 1% ½W High stability	6702	C2
R 7	150K-220K ¼W RMA9	10253	B4
R 8	22K ± 10% ½W RMA8	6706	D4
R 9	500Ω ± 10% ¼W RMA9	6704	D4
R10	1.8K ± 5% ¼W RMA9	7904	D4
R11	1M ± 10% ¼W RMA9	1171	D4
R12	22K ± 10% ½W RMA8	6706	E1
R13	1K ± 10% ¼W RMA9	1175	E4
R14	5K Pre-set pot.	7700	E3
R15	25K Potentiometer	7701	E4
R16	47K ± 10% ¼W RMA9	2933	F4
R17	620K ± 10% ¼W	5092	F3
R18	56K ± 10% ¼W RMA9	4406	G2

RESISTORS (cont.)

Ref.	Description	Pt. No.	Cir. Ref.
R19	3.3K ± 10% ¼W RMA9	2736	G4
R20	62K ± 10% ¼W RMA9	7905	G3
R21	2.2K ± 10% ½W RMA8	6781	G1
R22	1M ± 10% ¼W RMA9	1171	G4
R23	330Ω ± 10% ¼W RMA9	7705	H4
R24	1K Pre-set pot.	7699	H5
R25	750Ω ± 5% 1W RMA2	7780	J5
R26	2.97K ± 1% ¼W High stability	7771	J5
R27	733Ω ± 1% ¼W High stability	7769	K5
R28	500Ω ± 10% 3W Wire wound	11248	K1
R29	22Ω ± 10% ½W RMA8	6850	K3
R30	22Ω ± 10% ½W RMA8	6850	K3
R31	100Ω ± 10% ¼W RMA9	1273	J3

CAPACITORS

Ref.	Description	Pt. No.	Cir. Ref.
C 1	Wire trimmer	10177	A4
C 2	Wire trimmer	10177	A4
C 3	Wire trimmer	10177	B4



CAPACITORS (cont.)

	Description	Pt. No.	Cir. Ref.
3-30pF	Concentric trimmer	1620	B3
14-546pF }	Polar 624, type C. 1602	10555	B3
14-546pF }	Ganged variable capacitor	10555	B4
0.1F	350V. d.c. wkg. Paper tubular	5184	C4
8 μF	450V. d.c. wkg. Electrolytic	10760	D2
0.1 μF	350V. d.c. wkg. Paper tubular	5184	D2
10pF	Ceramic 10% H/Q type No. N750	7703	F4
	Not used		
0.1 μF	350V. d.c. wkg. Paper tubular	5184	F2
0.25 μF	350V. d.c. wkg. Metal pack tub.	7764	G4
0.1 μ	350V. d.c. wkg. Paper tubular	5184	G3
0.02 μF	150V. d.c. wkg. Min. paper tub.	7765	G4
16+16 μF	350V. d.c. wkg. Electrolytic	7014	F2 K2
0.005 μF	750V. d.c. wkg. Mica moulded	7131	L1
0.005 μF	750V. d.c. wkg. Mica moulded	7131	L2
16+16 μF	350V. d.c. wkg. Electrolytic	7014	J2 K2

MISCELLANEOUS

Ref.	Description	Pt. No.	Cir. Ref.
V1	Graphite coated 6SN7GT	5873	D3
V2	6J5GT	4413	G3
V3	6V6GT	4288	H4
V4	6X5GT	3150	K1
S1a-e	Range switch D. No. A4876	7697	
S2	Attenuator switch	7702	
S3	Mains switch	ONR15	L3
T1	Output transformer, low	MT315	H2
T2	Output transformer, high	MT316	H3
T3	Mains transformer	MT314B	
	Input: 105–125V / 210–250V } 50–100 c/s		
TH1	S.T. & C. thermistor, type 1522/100	6719	E4
TH2	S.T. & C. thermistor, type 1451/100	7811	E4
P1	Pilot lamp 6.5. 3A 11 mm. M.E.s.	879	L3
M1	0-40V a.c. rect. type 2in. Sq. flush (J2 Signal Generator only)		

OPERATING INSTRUCTIONS

POWER SUPPLY

The J1/NA and the type J2/NA are for operation at 117 volts, 25 to 60 c/s only. The standard J1 and J2 are normally despatched with the mains transformer set to operate at 210 to 250 volts and the tapping must be changed for 105 to 125 volts. To do this: Remove the disc on the underside of the case, uncovering the tags of the mains transformer. Tag 2 is connected to tag 3 for 210 to 250 volts input. For 105 to 125 volts remove the connection between tag 2 and tag 3. Connect tag 1 to tag 2, and tag 3 to tag 4. For J1/E and J2/E solder the flexible lead to the appropriate tag. Replace the cover disc. The instrument is provided with a 3-core cable so that the case may be earthed to the mains earth if desired.

The ON-OFF switch is incorporated in the output control.

FREQUENCY

A signal of any frequency between 15 c/s and 50 kc/s is set by using the range switch in conjunction with the calibrated dial.

Continuous adjustment is by means of the slow motion control situated centrally below the dial.

OUTPUT

Output into a 600 ohm load is taken from the two red terminals labelled 600 OHMS. Output into a 5 ohm load is taken between the

Advance

LOW FREQUENCY SIGNAL GENERATOR TYPE J

(Including J1, J2, J1/NA, J2/NA, J1E, J2/E.)

THE type J Signal Generators provide 1 watt output into 600 ohms, isolated from earth, over a frequency range of 15 c/s to 50 kc/s. A 5 ohm source is also provided giving a maximum output of not less than $\frac{1}{2}$ watt. The instrument contains a resistance-capacitance bridge oscillator feeding via a buffer valve into an output stage. The stabilization of the oscillator and the feed-back on the output stage provide a constancy of output with varying frequency of $\pm$ 1 dB, with distortion at full power output more than 34 dB down on fundamental (less than 2%). On the J1 the output is controlled by a calibrated potentiometer. The output voltage of the J2 is directly monitored by a first grade rectifier voltmeter.

The standard models operate from power supplies of 105 to 125 volts and 210 to 250 volts, a.c. only, 40 to 100 c/s.

The J1/NA and J2/NA operate from power supplies of 117 volts a.c. only, 25 to 60 c/s.

The J1/E and J2/E operate from power supplies of 110 to 125 volts, 140 to 160 volts, and 220 volts a.c. only, 40 to 100 c/s.

SPECIFICATION

FREQUENCY RANGES

A ... 50 kc/s to 4 kc/s

B ... 4 kc/s to 300 c/s

C ... 300 c/s to 15 c/s

Accuracy $\pm$(2% +1 c/s)

OUTPUT

Output into 600 ohms: 0.1mW to 1W (0.25V to 25V), continuously variable.

Accuracy: Model J1 $\pm$2 dB

Model J2 $\pm$(1dB +1.5% F.S.D.)

Maximum output into 5 ohms greater than $\frac{1}{2}$ watt, continuously variable.

OUTPUT IMPEDANCE

The output impedance approximates to 600 ohms over the whole range. Where close accuracy is required the 20 dB attenuator should be used.

ATTENUATOR

A 20 dB 600 ohm attenuator is incorporated. This is a π pad built of close tolerance resistors.

When switched in it provides a very accurate output impedance with a maximum output of 10 mW (2.5 volts).

black terminal marked E (which is an earthing terminal) and the adjacent red terminal. Variation of output is obtained by use of the output control. An additional control of output at 600 ohms is provided by the 20 dB attenuator by use of which a very accurate output impedance is obtained.

On the J1 the output control is calibrated in volts and watts (into 600 ohms). When the attenuator is switched in, the volts scale should be divided by 10. When the J1 is used with high impedance termination and the 20 dB attenuator not used, a voltage approximately twice that indicated is obtained with some increase in distortion at high levels. If the 20 dB attenuator is used, the voltage at high impedance is twice the voltage indicated, with no increase in distortion.

On the J2 the output without the 20 dB attenuator is that indicated by the meter, there being no increase in distortion if the output is not terminated. When the 20 dB attenuator is in circuit and the output is loaded with 600 ohms, the output voltage is one-tenth of that indicated. When the load is of high impedance the output voltage is one-fifth of that indicated.

OPERATING INSTRUCTIONS

The 600 ohm output is not connected to earth, but either terminal may be earthed.

One side of the 5 ohm winding is earthed.

The black terminal marked E provides an earth connection, for use as required.

To remove the instrument from the case proceed as follows:
REMOVE THE TWO COIN-SLOTTED SCREWS FROM THE REAR OF THE CASE.

Lay the instrument on its back and unscrew the four screws in the corners of the panel a little at a time. The instrument can then be lifted and removed from the case.

To reassemble: Lay the case on its back and replace the instrument.

Engage the threads of the corner screws and screw up evenly.

Replace the two coin-slotted screws.

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